NOAA REPORT

Vol. V, No. 11 November 1996

Marine Sanctuary Referendum Voted Down: Despite strong editorial endorsements from the Miami Herald, Florida Keys Reporter, and Key West Citizen newspapers, voters in Monroe County, Florida, said no to a non-binding referendum supporting the Florida Keys National Marine Sanctuary by a 10 point margin.

Year 2000 Effort Continues: NOAA is continuing activities that address the challenges presented to computer systems by the coming turn of the century to the Year 2000. Many computer systems in business and government assign two digits to the year—'96' for 1996, for example. However, at midnight January 1, 2000, when those digits change from '99' to '00,' some systems may assume that '00' stands for the year 1900. Left unchecked, the potential for havoc is enormous.

Major NOAA components have performed preliminary assessments and developed budget estimates for easing any problems caused by the Year 2000. Next in NOAA's Year 2000 activities will be the development of plans by each office. These plans will be merged to form NOAA's Year 2000 plan, which will be forwarded to the Department of Commerce near the end of the year. NOAA's Year 2000 plan will become part of the Commerce Department's Year 2000 plan, which will be submitted to OMB and Congress early next year.

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News Briefs

ALEXANDER MALAHOFF

The Pisces V *is lowered into the Pacific to investigate the collpase of the underwater volcano Loihi off the coast of Hawaii.*

Collapsing Undersea Volcano Gives View of Island's Birth

The recent collapse of the lava dome of the underwater volcano Loihi off Hawaii has created a murky crater a half mile across and a thousand feet deep, and given scientists in a research mini-sub a close-up look at the ongoing birth of the next Hawaiian island, according to researchers just back from the site.

The research expedition aboard the research vessel *Ka'imikai-o-Kanaloa* (Hawaiian for "investigator god of the sea", also known as the *K-o-K*), which began Sept. 25 and continued off the big island of Hawaii until Oct. 12, is sponsored by NOAA and led by Alexander Malahoff, director of the Hawaii Undersea Research Laboratory at the University of Hawaii.

"This was a Mount St. Helen-sized volcanic event," Malahoff said. "Pele's Dome, an area on the southern rim of the volcano that previously had been considered very stable, has simply vanished into a giant pit, which we have named the Pele's Pit Crater. What we learn from this event will have profound implications for virtually everything we now know about undersea volcanism—including the effects of volcanic carbon dioxide emissions on climate, the possible generation of tsunamis that could strike coastal areas, and the impacts on the microscopic organisms that live in and near sea floor vents."

In a series of six dives into the

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Federal Center Shares Purchasing Innovation With Other Government Agencies

Facing a dwindling supply of electronics parts for Federal agencies' equipment, workers at NOAA's National Reconditioning Center in Kansas City think they have found a solution to the problem and have begun sharing it with other Federal agencies.

With responsibility for repairing radar and electronics equipment for the National Weather Service and other NOAA offices, the Center recently hosted a meeting of Federal and military representatives to demonstrate how advances in parts research and test equipment can ensure a continued supply of often-rare or obsolete parts used by Federal agencies. Mike Terrell, a technical advisor at the Center, said a meeting held at the end of July holds promise for several Federal and Defense Department agencies to overcome a growing scarcity of components, such as integrated circuits, used in government systems.

Terrell explained that a cost-cutting directive known as the Perry Initiative suspended the requirement that electronics manufacturers meet government and military standards and directed the Defense Logistics Agency to reduce large inventories of electronics parts.

"Following that directive, manufacturers moved away from components that met government and military standards to non-standard parts to be used in low-cost consumer products," Terrell said, "and supplies soon started to dwindle. The National Weather Service faced the distinct possibility of not having spare parts for its new WSR-88D Doppler radar over its expected life cycle, and we were far from the only agency facing that prospect.

"Fortunately, we started working with the Department of Defense years ago to explore ways to diagnose faulty parts and to ensure that replacement parts were available when needed."

According to Terrell, the Navy's Defense Logistics Agency had developed a parts management program known as Technology Obsolescence Risk Assessment

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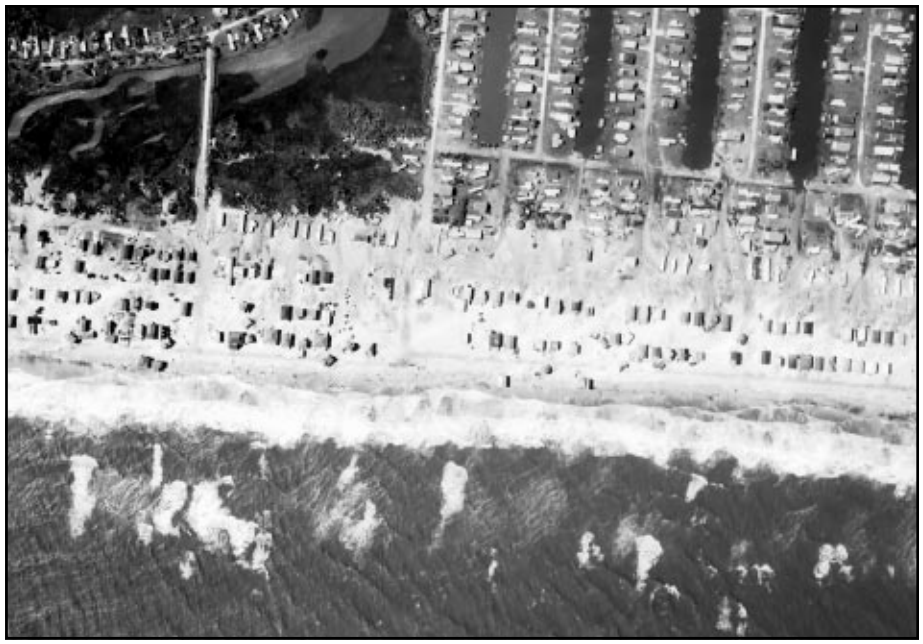

Hurricane Fran raged through Topsail Beach, N.C., smashing homes along the shoreline into the sea, as depicted in this aerial photo taken from a NOAA Shrike aircraft.

NOAA Aircraft Aid Other Federal Agencies

Hurricane Fran's Devastation Seen From Aircraft

From a NOAA Shrike aircraft, NOAA Corps officers Lt.j.g. Mike Weaver and Lt.j.g. Mark Hickey, with NOS's Aeronautical Charting Division, captured the devastation caused by Hurricane Fran in September along Topsail Beach in North Carolina. The first line of homes along the beach are missing, and the second and third lines are severely damaged—dramatic evidence of the storm's terrible impact.

Other NOAA aircraft were pressed into service as well at the request of other Federal agencies. A NOAA Twin Otter flew a low-level video survey for the U.S. Geological Survey as part of its beach erosion studies, and a NOAA helicopter equipped with the SHOALS laser bathymetric system scanned the coastal waters at the urgent request of the Army Corps of Engineers for build-ups of sand and other navigational hazards.

NOAA Ship *Rude* Hosts RI Congressman

Congressman Jack Reed (D-RI) thanked the *Rude's* NOAA Corps officers and crew during an open house in September for their excellent work in support of Rhode Island's marine interests, and said the work of NOAA and its commissioned corps is critical to a maritime state like Rhode Island.

"As we gave Congressman Reed a tour of the ship, he seemed very impressed with the technical and personnel capabilities that enable the *Rude* to quickly respond to the needs of maritime commerce and ensure that ships can move safely through Narragansett Bay. He was especially pleased to learn we would begin surveying the approaches to Quonset Point that same day," said Cmdr. Sam DeBow, *Rude* commanding officer.

Also attending the open house were members of the maritime community, including the Northeast Pilots Association, Rhode Island Marine Trade Association and International Longshoremen Association.

From left: Commanding Officer Cmdr. Sam DeBow, Congressman Jack Reed (D-RI), and Executive Officer Lt. Cheryl Thacker during an open house aboard the NOAA ship Rude*, held at Goat Island Marina in Newport, R.I.*

The *Rude* is a hydrographic survey vessel that scans the ocean floor for rocks, debris and other navigational hazards. Once an area is surveyed, charts are created or updated.

The *Rude* shone under the national spotlight last July, after TWA Flight 800 exploded and crashed into the Atlantic Ocean. Immediately following the incident, DeBow diverted the ship from its scheduled surveying activities off Rhode Island to the crash site near Moriches, Long Island. The *Rude* found all the major aircraft wreckage within 48 hours. An on-site NOS team of mostly NOAA Corps officers used the *Rude's* data to create charts that precisely pinpointed major debris fields, which enabled Navy divers to recover victims and wreckage as quickly as possible.

Earth & Sky Radio Update

Following are November's NOAA-related topics for Earth & Sky Radio:

Frost Quakes—Nov. 2

The Aral Sea—Nov. 25

The Washington, D.C., affiliate for Earth & Sky is WDCU-FM, 90.1, airing Monday through Friday at 8:00 a.m. For the station nearest you, or for a copy of the scripts, call Jeanne Kouhestani at 202/482-6090 or e-mail her at jeanne.g.kouhestani@noaa.gov. After airing, scripts are posted on Earth & Sky's Internet home page at http://www.earthsky.com.

Earth & Sky

NGDC Receives Magazine Award

NOAA's National Geophysical Data Center in Boulder, Colo., has received an award from *Government Computer News* for excellence in the application of information technology. The center was cited for its outstanding performance in improving services delivery to its customers. The data center was cited for its innovative application of information technology and improvements in services delivery. The award was presented to Chris Miller, of NESDIS's Environmental Information Services division.

Focus On...

Coastal Management in Texas

After a number of earlier attempts to develop a coastal management program—efforts characterized by an often contentious political environment, heated debate and controversy—the state of Texas is scheduled to join the National Coastal Management Program in mid-November 1996.

Texas is the 30th out of the 35 eligible U.S. coastal states and territories to enter the voluntary program since its inception under the Coastal Zone Management Act of 1972. Established to resolve conflicting demands along the Nation's coasts, the Coastal Zone Management Program strives to soften the impacts that human population growth, development, unsound agricultural practices, transportation and recreation can have on coastal resources.

The national program is a unique partnership between local and state governments and the NOS Office of Ocean and Coastal Resource Management (OCRM). OCRM provides coastal states financial and management assistance to implement Federally approved coastal management programs while advocating CZMA goals through legislation and policy development and providing consistency on a national level. The states develop their own programs which meet and advance the national CZMA requirements and objectives such as, protecting wetlands, beaches and dunes; protecting life and property from coastal storms, erosion and other hazards; promoting public access to the coast; and preserving coastal water quality.

A shrimping boat moves through Galveston Bay out to the rich waters of the Gulf of Mexico. The health of these ecosystems, as well as the livelihood of the fisherman harvesting them, are related to the success of the Texas CZM Program.

The national program has accomplished a great deal in its 24 years, including the significant reduction of coastal wetland and habitat loss. Development in hazardous coastal areas has also decreased, helping to curb erosion, and reduce property damage and state and Federal disaster assistance costs. Coastal programs have also increased public access to the coast significantly by creating thousands of new access ways, boat ramps and public piers.

The Texas program is based in large part on the Texas Coastal Coordination Act and a key administrative mechanism, the Coastal Coordination Council. The Council, established in 1991, is comprised of representatives from numerous state agencies and chaired by the Texas Land Commissioner. The Council was created to provide a single body that would develop uniform coastal policies and coordinate the actions of disparate state organizations. It also allows for intrastate coordination when coping with coastal problems that traverse local jurisdictional boundaries; such as inland water withdrawals and beach and dune protection and management. The Texas General Land Office will play a lead role in implementing the state program, and will be largely responsible for distributing the Federal CZM funds for the various programmatic activities.

The 3,300-mile Texas Gulf coast presents a host of opportunities and challenges to managers. The state program is responsible for the sound management of the resources along shoreline and for balancing the many

uses in the 8.9 million acre coastal zone. Of this coastal zone, 1.5 million acres are coastal wetlands and grass beds, crucial habitat for sustaining a vibrant aquatic ecosystem. Texas also contains approximately 275,000 acres of tidal sand and mud flats. This immense tract constitutes 14 percent of the Nation's total, more than any other single state, and provides a home for migrating waterfowl and estuarine animals.

However, these resources are far from pristine. The state has lost nearly half of its coastal wetlands through development and unsustainable activities.

Texas' extensive shoreline, especially its 367 miles of barrier islands, is not only home to the wildlife that thrive off the warm Gulf waters, but also to an enormous tourism trade and industrial sector. In fact, in one year, coastal recreation and tourism, the state's second largest business, accounted for $17 billion in revenue. Half of U.S. chemical production and 30 percent of U.S. petroleum refining industries are also found along the Texas coast. The shipping industry is another major section of the local economy. Texas is home to five of the top 25 U.S. ports, including the second and sixth largest U.S. ports—Port of Houston and Corpus Christi, respectively. In addition to the various industrial uses, the state's coastal zone supports a burgeoning population of four and a half million.

As with other states, the Texas Gulf coast is fast becoming a popular destination for tourists, industry and residents alike, increasing pressure on its resources and on the need for comprehensive management. The Texas Coastal Management Program will help allay some of the problems and play an instrumental part in preserving the state's vital marine ecology while supporting economic prosperity.

—Steve Morrison and Bill O'Beirne

As our nation continues to view the coast as an increasingly popular locale to live, work and play, pressures on its limited resources place a strong emphasis for comprehensive management.

Drowned Shore Tells Story of Rapid Sea Rise

University of South Florida marine scientists have discovered a series of drowned shorelines off Key West that indicate abrupt changes in the rates of sea-level rise as the Earth was emerging from the last ice age.

During the last ice age, about 18,000 years ago, sea level was about 400 feet lower than it is today. The rising sea level was caused by the melting of huge glacial ice sheets in response to global warming.

The findings of this study are significant because they provide scientific evidence of how suddenly and rapidly sea level is capable of rising in response to Earth's changing climate, posing obvious threats to low-lying, densely populated coastal areas.

The study, partially funded by NOAA's Undersea Research Program, is reported in the Sept. 1996 issue of *Geology* magazine.

Divers Find 'Bus Size' Boulders in Volcano

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volcano aboard the research submersible *Pisces V*, the NOAA-funded university scientists witnessed dramatic evidence of the impact of swarms of sea floor earthquakes that have struck Loihi since mid-July, including the collapse of giant lava rock formations, continuing subsea tremors and landslides, and the creation of new vents spewing a mix of superheated water, dissolved minerals and massive mats of chemosynthetic bacteria that limited the scientists' visibility to a meter or less.

Researchers operating from the *K-o-K* also produced a new sonar map of the volcano and used *Pisces V* to photograph the new topography and hydrothermal venting there, sample seawater in and near the vents to measure concentrations of bacteria and minerals, install sea floor pressure monitoring devices that would signal further collapses of the sea floor, and identify locations to safely position other measuring devices for long-term monitoring.

Summit Collpases

The whole summit of the volcano, about 3,000 feet below sea surface, has collapsed, shaken by swarms of sea floor earthquakes and the withdrawal of magma within the volcano, said Malahoff, who made the first three of six dives into Loihi in *Pisces V* September 25-27. "A four to five square-mile area of the sea floor is completely devastated, strewn with bus-sized volcanic boulders, some so precariously perched that we had to be careful not to bump them with the sub. Compared to what I've observed here in past dives, perhaps 325 million cubic yards of volcanic rock slid into the volcano," he said.

"The currents are very tricky there. Water is flowing down into this

ALEXANDER MALAHOFF

The research vessel Ka'imikai-o-Kanaloa *lowers the mini-sub Pisces V to investigate the underwater volcano Loihi, off the Hawaiian coast.*

newly formed pit on the northern end, where it percolates through the volcano, mixes with minerals and bacterial matter, then rushes out over a lip on the western edge of the volcano. We had to be careful in the sub not to get sucked down by the inflow on the north side of the volcano and buoyed up by the outflow on the western rim.

"The southern face of the volcano is the most active area now, but the whole volcano is very unstable. We think the landscape is still changing since vents that we had found in an earlier dive are no longer there. The northern end appears intact—for now, " Malahoff said.

The water in the volcano is very turbid, with visibility down to about a meter in most places, clouded by a combination of dissolved minerals in the water and huge floating mats of chemosynthetic bacteria. The bacteria, which feed on dissolved nutrients, have immediately begun colonizing the new hydrothermal vents, according to University of Hawaii biologist James Cowen, who also dove into Loihi, as did his assistant Charles Holoway, on Sept. 28 and Sept. 30, respectively. Both collected samples of the chemosynthetic bacteria, which can be indicators of the type of inorganic material ejected from the vents, for follow-up studies in their laboratory.

University of Hawaii seismologist Fred Duennebier dove into the less active northern end of Loihi Sept. 29. The topography there appeared unaffected, with huge lava columns still standing. Duennebier will return to Loihi this winter to establish a permanent undersea geological observatory on the volcano to monitor future volcanic activity.

Submersible pilots Terry Kirby and Allen Wright of the Hawaii Undersea Research Laboratory operated the three-person *Pisces V* on all dives.

(For more information on Loihi expedition, see their World Wide Web home page, http://www.soest.hawaii.edu/HURL/hurl.html.)

—Dane Konop

NOAA Honors Grads, While Own Grads Honored by Penn State

It's been a busy season for NOAA in academia, with the awarding of graduate fellowships and the honoring of some of its leading scientists by their alma mater.

Penn State Centennial Fellows Named

Nine NOAA scientists recently returned to Pennsylvania State University's College of Earth & Mineral Sciences to be honored as Centennial Fellows by their former school.

The Centennial Fellow award recognizes some of the alumni of the College of Earth & Mineral Sciences (EMS) who have excelled in their field. Penn State held a formal celebration in honor of these individuals on September 20 and 21, 1996. Representatives of other government agencies, corporate, private, and academic fields were also recognized during the awards ceremony. This award was part of EMS's 100 year anniversary celebration.

The NOAA scientists who were honored include Kenneth Batty, lead forecaster, Charleston, W.Va., Weather Forecast Office; Gary Briggs, meteorologist, Air Resources Laboratory; Stephen Corfidi, meteorologist, Storm Prediction Center; James Hoke, director, Hydrometeorological and Marine Prediction Centers; W. John Hussey, director, Systems Development Office, NESDIS; Robert Livezey, senior research meteorologist, Climate Prediction Center; Lauren Morone, meteorologist, Environmental Modeling Center; Steven G. Perry, research meteorologist, National Exposure Research Laboratory; and Richard Przywarty, chief, Office of Meteorology Services Division.

"The Centennial Fellows have been chosen in the College's 100th year to exemplify the success of their programs," said John Dutton, dean of the College of Earth and Mineral Sciences. "The Fellows are approaching or are at the prime of their careers in the private sector, academia, and public service. We are honored and privileged to congratulate all of these individuals for their commitment to excellence."

Three Graduate Fellowships Awarded

NOAA's National Weather Service and Office of Global Programs, in partnership with the American Meteorological Society (AMS), have awarded graduate fellowships to three college students, to aid in their meteorological and marine studies.

George H. Bryan, recipient of the AMS/NWS Graduate Fellowship, completed his undergraduate work at Pennsylvania State University with a degree in meteorology. The award will help Bryan pursue a Ph.D. in meteorology at Penn State. Joseph A. MacDonald, who received the AMS/NOAA's Office of Global Programs Fellowship, is a graduate of the University of Michigan with a degree in atmospheric science. He will pursue a Ph.D. in tropical meteorology at Florida State University. Tracy A. Monegan also received the AMS/NOAA's Office of Global Programs Fellowship. Monegan, a graduate of Wittenberg University with a degree in geology, will pursue a Ph.D. in marine science, studying developed shorelines at Duke University.

—Paul Kinville

Focusing on Abilities, Not Disabilities

Stressing the contributions that the disabled can make in the workplace, NOAA commemorated National Disability Employment Awareness (NDEA) Month last month with a series of workshops designed to focus on abilities rather than disabilities.

A new video on "(Dis)ability Awareness" served as the kickoff for the programs on October 8. The film, which featured a special guest appearance by President Clinton, focused on the abilities of people with disabilities in the workplace. Not only did the video highlight the contributions of people with various disabilities, but it also dispelled common stereotypes and myths.

Stress Management was the topic of a presentation by Beverley Black, the director of the Anxiety Disorders Program at the RoundHouse Square Counseling Center in Alexandria, Va. She explained how to manage stress in the workplace and shared strategies for coping with the demands of life.

One key to minimizing stress, Black said, is to focus on breathing—closing your eyes, inhaling slowly, and then exhaling. To keep the mind clear, she recommends saying a word or phrase, such as "relax" or "peace" while we exhale. Black suggested we perform this exercise for ten minutes daily, preferably in the morning, to reduce stress in our lives.

The third program for NDEA Month involved a presentation by Seville Allen who works with the Computer/Electronic Accommodations Program (CAP) with the U.S. Department of Defense. CAP provides surplus adaptive equipment to assist people with physical disabilities in performing the duties of their positions.

A fourth and final program, a forum on accessibility of NOAA buildings in the Washington area, was sponsored by NOAA's Facilities Management Division.

Becky Matzko of the Civil Rights Office developed the programs.

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Chief Scientist Receives Great Lakes Service Award: Acting Chief Scientist Al Beeton received the Great Lakes Commission Outstanding Service Award at the commission's annual meeting last month. The award is presented to an individual who has "demonstrated an outstanding spirit of cooperation and interagency support for the Great Lakes." Beeton, the former longtime director of NOAA's Great Lakes Environmental Research Laboratory in Ann Arbor, Mich., was commended by commission chair Donald Vonnahme for forging a strong partnership between NOAA and the commission. Vonnahme cited Dr. Beeton as "an outstanding example of a rare breed of

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individual who is comfortable as a member of both the science and policy communities." In accepting the award, Beeton said, "This award means something very special to me because I have long admired the Great Lakes Commission for all the good things they have done."

Sea Turtles Protected: Endangered sea turtles that enjoy a high degree of protection in U.S. waters may receive similar safeguards in other areas throughout the Western Hemisphere as the result of a historic international agreement. The international agreement, the first of its kind devoted solely to the protection of sea turtles, was signed Sept. 5 in Brazil by the United States and 14 other countries from North, Central and South America, and the Caribbean.

Innovation Comes to Federal Purchasing

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(TORA) and adapted it for NOAA use at the Technology Center in Indianapolis.

TORA was coupled with the Consolidated Automatic Support System (CASS), which the Navy purchased from Lockheed-Martin. CASS allows a single piece of diagnostic equipment to test multiple computer systems. CASS was developed more than 20 years ago to eliminate the Navy's need to have separate diagnostic equipment to test computerized guidance, avionics and weapons systems. It replaces more than 50 older testers now being phased out of the Navy fleet.

"NOAA was the first non-military user of TORA and CASS," Terrell said, "We spent three years developing CASS to make it work. Since then, we've been able develop 30 test program sets for unique circuit boards used in the WSR-88D weather radar. We use TORA to help us locate needed parts.

"Integrated circuits used in electronics have gone through incredible advances that make them faster and more efficient. The downside to this rapid development is that some components become obsolete shortly after they're developed and manufacturers don't want to continue making the older parts any longer than necessary. But many systems, such as those used by the Federal government, require those older components. We've made progress in solving this problem and can now help other agencies do the same. We hosted the July meeting to demonstrate those test programs to show how to save time and money by using what other agencies have already developed and implemented."

The National Reconditioning Center continues to develop computer databases of parts lists shared in the Government-Industry Data Exchange Program, making it easier for agencies to locate and acquire needed parts. In addition, capabilities continue to be developed to replicate obsolete parts when necessary.

"One agency at the conference is spending a million dollars to implement a database similar to TORA," Terrell said. "We demonstrated TORA and CASS to show that cooperation can solve problems more quickly and save development and implementation costs. The program generated a lot of interest among the other agencies and they were optimistic that adaptations can be made to help maintain long-term operation of their systems.

—Pat Slattery

CORRECTION

The article "International Meteorologists Learn Hurricane Forecasting Techniques" in the October 1996 *NOAA Report* was written by Jeffrey Stuart.

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